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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,046	02/26/2004	Shinichi Takeshima	118849	5174
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EXAMINER WARTALOWICZ, PAUL A				
ART UNIT 1793		PAPER NUMBER		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/786,046

**Applicant(s)**

TAKESHIMA, SHINICHI

**Examiner**

PAUL A. WARTALOWICZ

**Art Unit**

1793

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,4-8 and 10-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-8 and 10-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S5108)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Arguments*

Applicant's arguments filed 3/3/09 have been fully considered but they are not persuasive.

Applicant argues that Sherif does not provide a rationale to modify Nawa to provide a first element in an organic solution and a second element in an aqueous phase that reacts at an interface at the organic/aqueous phase interface or to add an alkali to a microemulsion to adjust the pH for colloid aggregation.

However, Sherif is relied upon to teach that it is known to form metal oxides from hydrolysis reactions wherein metal alkoxides are the starting material. Sherif is not relied upon to teach a second element in an aqueous phase that reacts at an interface at the organic/aqueous phase interface or to add an alkali to a microemulsion to adjust the pH for colloid aggregation. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues that Chittofrati teaches that the reaction occurs in the aqueous phase and that the metal element in the organic phase forms a salt with **the** surfactant (emphasis added).

However, Chittofrati teaches that the microemulsion exists with an aqueous salt present in the aqueous phase and an organic salt present in the organic phase (col. 4, lines 6-12). Additionally, it appears that the organic metal is in the form of a surfactant salt, but not necessarily the surfactant that forms the microemulsion. Chittofrati teaches that the microemulsion is obtained by adding a anionic, cationic, or nonionic surfactant, but that the metal salt in the organic phase is a salt of an anionic salt (col. 3, lines 59-68). Therefore, it appears that the metal element in the organic phase forms a salt with the surfactant used to form the microemulsion.

Additionally, applicant argues that the salt in the organic phase is disassociated on contact with the aqueous phase. However, Chittofrati teaches that the microemulsion exists with an aqueous salt present in the aqueous phase and an organic salt present in the organic phase (col. 4, lines 6-12). Therefore, it appears that the metal element of the organic phase does not become incorporated into the aqueous phase upon contact.

Additionally, Chittofrati is relied upon to show a microemulsion formed by contacting an organic solvent with an organic salt disposed therein with an aqueous solvent with an aqueous salt therein in the presence of a surfactant (col. 3-4). Chittofrati is not relied upon to teach the formation of a hydroxide of said first element produced by hydroxide reaction. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re*

*Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues that Nawa only teaches a double precipitate method.

However, Nawa is only relied upon to teach the addition of a cerium salt in an aqueous phase. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-2, 4-6, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sherif (U.S. 5023071) in view of Nawa et al. (U.S. 5863850) and Chittofrati et al. (U.S. 5670088) and Sato (US 4987012).

Sherif teaches a process for the formation of metal oxides from corresponding a zirconium alkoxide by a hydrolysis reaction (col. 1, lines 9-11) wherein a surfactant is added to a solution comprising metal alkoxide that forms an emulsion (Throughout document, particularly col. 2, lines 15-20). Sherif also teaches two heating steps, the first heating step at a temperature of 425°C, the second heating step at a temperature of 800°C (col. 2, this appears to meet the limitation of firing in claims 1 and 6).

Sherif fails to teach wherein the aqueous phase has a cerium salt therein and that the emulsion is a microemulsion.

Chittofrati et al. teach a method of making mixed metal oxides (col. 1) wherein a microemulsion is formed by contacting an organic solvent with an organic salt disposed therein with an aqueous solvent with an aqueous salt therein in the presence of a surfactant (col. 3-4) for purpose of providing mixed metal oxides having a size of lower than 10 nm (col. 3).

Therefore, it would have been obvious to one of ordinary skill in the art to provide a microemulsion is formed by contacting an organic solvent with an organic salt disposed therein with an aqueous solvent with an aqueous salt therein in the presence of a surfactant (col. 3-4) in Sherif in order to provide a mixed metal oxides having a size of lower than 10 nm (col. 3) as taught by Chittofrati.

Additionally, Nawa et al. teach a process for making a zirconia based ceramic material (col. 1, lines 10-12) comprising the mixed oxide of cerium, titanium, and zirconium (col. 5, lines 63-66) wherein an aqueous solution containing multiple metal elements including a cerium salt is mixed with an organic solution of a metal alkoxide to obtain a mixed metal oxide (col. 1, 6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide an aqueous solution containing multiple metal elements including a cerium salt mixed with an organic solution of an alkoxide (col. 1, 6) in Sherif in order to produce a mixed metal oxide including cerium as taught by Nawa.

Regarding the limitation of adding an alkali to adjust pH for colloid adjustment, Sato teaches a method of preparing mono-dispersed particles of metal oxides (col. 1) wherein an alkali is added to a system including a metal hydroxide for the purpose of stabilizing the aggregates and producing particles having a size of 100 nm (col. 1, 5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide an alkali added to a system including a metal hydroxide in Sherif in order to provide stabilization of the hydroxide aggregates and to produce particles having a size of 100 nm (col. 1, 5) as taught by Sato.

As to the limitation wherein the size of the aqueous phase of the water-in-oil type microemulsion is in the range of 2-40 nm, it appears that the prior art teaches a substantially similar process as the claimed invention such that the properties of the

microemulsion formed in the prior art are substantially similar those formed by the claimed invention, including size.

As to the limitations of the compound oxide particles having a composition that is uniform at the atomic level, the combined prior art teach a substantially similar process such that the properties of the product of said process are substantially similar to those of the product of the present invention.

Claims 7, 8, and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sherif (U.S. 5023071) in view of Nawa et al. (U.S. 5863850) and Chittofrati et al. (U.S. 5670088) and Sato (US 4987012) and Uenishi et al. (U.S. 20020061816).

Sherif et al. teach a process for making a zirconia based ceramic material as described above in claim 1. The combined teachings of Sherif, Chittofratti, and Nawa meet the claimed limitation wherein a process for production of an exhaust gas purification catalyst carrier by a production process such that characteristics of the product are inherently taught because the limitations of the process of making are disclosed.

Regarding the process for production of an exhaust gas purification catalyst carrier by a production process, Uenishi et al., however, teach a process for purifying exhaust (paragraph 0004, lines 1-5) wherein a mixed oxide comprising zirconium and cerium are used as catalysts (paragraph 0008, lines 1-5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide wherein a mixed oxide comprising zirconium and cerium are used as catalysts (paragraph 0008, lines 1-5) as taught by Uenishi et al.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL A. WARTALOWICZ whose telephone number is (571)272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Paul Wartalowicz  
May 11, 2009

/Stanley Silverman/  
Supervisory Patent Examiner, AU 1793